Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

A-1 Enviromental, Inc.

Attn: Cameron Hernandez

6109 South Don Carlos Dr. Taylorsville, UT 84118

Customer Project: ASARCO Demo (south lab) 3440 S. 700 W.

Reference #:

CAL09042401

Date

4/15/2009

Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are preformed. Calibrated liquid refractive oils are used as liquid mouting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjugation with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated of asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

Vermiculite containing samples may have trace amounts of actinolite-tremolite, where not found be PLM should be analyzed using TEM methods and / or water separation techniques. Suspected actinolite/vermiculite presence will be indicated through the sample comment section of this report.

Fibrous talc containing samples may even contain a related asbestos fiber known as anthophyllite. Under certain conditions the same fiber may actually contain both talc and anthophyllite (a phenomenon called intergrowth). Again, TEM detection methods are recommended. CA Labs PLM report comments will denote suspected amounts of asbestiform anthophyllite with talc, where further analysis is recommended.

Some samples (floor tiles, surfacings, etc.) may contain fibers too small to be delectable by PLM analysis and should be analyzed by TEM bulk protocols.

A "trace asbestos" will be reported if the analyst observes far less than 1% asbestos. CA Labs defines "trace asbestos" as a few fibers detected by the analyst in several preparations and will indicate as such under these circumstances.

Quantification of <1% will actually be reported as <=1% (allowable variance close to 1% is high). Such results are ideal for point counting, and the technique is mandatory for friable samples (NESHAP, Nov. 1990 and clarification letter 8 May 1991) under 1% percent asbestos and the "trace asbestos". In order to make all initial PLM reports issued from CA Labs NESHAP compliant, all <1% asbestos results (except floor tiles) will be point counted at no additional charge.

Qualifications

CA Labs is accredited by NVLAP and AIHA for selected test methods for bulk asbestos fiber analysis (PLM) and airborne fiber analysis (TEM). All analysts have a college degree in a natural science (geology, biology, or environmental science) or are recognized by a state professional board in one these disciplines. Extensive in-house training programs are used to augment education background of the analyst. The group leader of polarized light has received supplemental McCrone Research training for asbestos identification. Analysis performed at Crisp Analytical Labs, LLC 2081 Hutton Dr, Suite 301 Carrollton, TX 75006

Dallas NVLAP Lab Code 200349-0 TEM/PLM EPA H20 TX 01402 TDH 30-0235

AIHA PLM Accreditation 102929

Overview of Project Sample Material Containing Asbestos

Customer Project:		ASARCO Demo (south lab) 3440 S. 700 W.		CA Labs Project #: CAL09042401		
Sample #	Layer #	Analysts Physical Description of Subsample	of Asbestos type / calibrated visual estimate percent	List of Affected Building Material Types gray insulation gray layered insulation		
EI-7	7-1	gray insulation				
PI-10	10-1	gray layered insulation	46% Chrysotile	_		

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

ca - carbonate gypsum - gypsum pe - perlite

fg - fiberglass

pa - palygorskite (clay)

gypsum - gypsubi - binder or - organic qu - quartz

mw - mineral wool wo - wollastinite

ta - talc sy - synthetic ce - cellulose br - brucite

ma - matrix mi - mica ve - vermiculite ot - other

ka - kaolin (clay)

This report relates to the items tested. This report is not to be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST or any other agency of the federal government. This report may not be reproduced except in full without written permission from CA Labs. These results are submitted pursuant to CA Labs' current terms and sale, condition of sale, including the company's standard warranty and limitations of liability provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, CA Labs will store the samples for a period of ninety (90) days before discarding. A shipping or handling fee may be assessed for the return of any samples.

Customer Project: CA Labs Project #: **Customer Info:** Attn: Cameron Hernandez CAL09042401 A-1 Enviromental, Inc. 6109 South Don Carlos Dr. ASARCO Demo (south lab) 4/15/2009 Taylorsville, UT 84118 3440 S. 700 W. Date: **Turnaround Time:** 4/15/09 9:00am Samples Received: Phone # 801-403-8803 24 hours Purchase Order #: Fax# 801-967-5326 Analysts Physical Description of Homo-Asbestos type / Non-asbestos fiber Non-fibrous type Sample # Com Layer calibrated visual type / percent / percent ment Subsample geneo estimate percent us (Y/N) None Detected 100% qu,bi tan surfacing 10% ce 90% gu,gy None Detected white drywall with paper None Detected 100% bi,qu,ca tan surfaced white plaster n None Detected 100% qu,ca gray plaster None Detected 100% qu,bi CT-3 tan surfacing 100% ce None Detected tan ceiling tile CT-4 100% ca,bi white surfacing None Detected TDH 30-0235 Dallas NVLAP Lab Code 200349-0 TEM/PLM AIHA PLM Accreditation 102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for identification of asbestos types by dispersion attaining / becke line method.

ca - carbonate mi - mica fg - fiberglass ce - cellulose

ve - vermiculite mw - mineral wool br - brucite gypsum - gypsum ka - kaolin (clay) bi - binder ot -other wo - wollastinite pa - palygorskite (clay) or - organic pe - perlite ta - talc

sy - synthetic

221-2

Christopher Williams

Analyst

qu - quartz

QAC

Technical Manager Chad Lytle

Approved Signatories:

Leslie Crisp, P.G. 6. Anthophyllite in association with Fibrous Talc

Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
 Fire Damage no significant fiber damages effecting fibrous percentages

3. Actinolite in association with Vermiculite

4. Layer not analyzed - attached to previous positive layer and contamination is suspected

ma - matrix

5. Not enough sample to analyze

Contamination suspected from other building materials
 Revorable scenario for water separation on verniculite for possible analysis by another method

9. < 1% Result point counted positive

10. TEM analysis suggested

Customer Project: CA Labs Project #: Attn: Cameron Hernandez Customer Info: CAL09042401 A-1 Enviromental, Inc. 6109 South Don Carlos Dr. ASARCO Demo (south lab) 4/15/2009 Date: Taylorsville, UT 84118 3440 S. 700 W. 4/15/09 9:00am Samples Received: **Turnaround Time:** 24 hours Phone # 801-403-8803 Purchase Order #: Fax# 801-967-5326 Asbestos type / Non-asbestos fiber Non-fibrous type Analysts Physical Description of Homo-Sample # Com Layer geneo calibrated visual type / percent / percent Subsample ment estimate percent us (Y/N) 20% fg None Detected 80% ce tan ceiling tile 100% ca,bi None Detected white surfacing CT-5 20% fg 80% ce None Detected tan ceiling tile 100% bi None Detected CT-6 white surfacing None Detected 100% ce tan ceiling tile 88% qu,gy,ca 12% Chrysotile EI-7 gray insulation EI-8 gray insulation positive stop Dallas NVLAP Lab Code 200349-0 TEM/PLM EPA H20 TX 01402 TDH 30-0235

AIHA PLM Accreditation 102929

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sy - synthetic

ce - cellulose br - brucite ka - kaolin (clay) pa - palygorskite (clay)

Approved Signatories:

2210 Christopher Williams Analyst

QAC Leslie Crisp, P.G.

Technical Manager Chad Lytle

1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers

Fire Damage no significant fiber damages effecting fibrous percentages
 Actinolite in association with Vermiculite

Layer not analyzed - attached to previous positive layer and contamination is suspected

5. Not enough sample to analyze

6. Anthophyllite in association with Fibrous Talc

7. Contamination suspected from other building materials
8. Favorable scenario for water separation on vermiculite for possible analysis by another method

< 1% Result point counted positive 10. TEM analysis suggested

Customer Project: CA Labs Project #: **Customer Info:** Attn: Cameron Hernandez CAL09042401 A-1 Enviromental, Inc. ASARCO Demo (south lab) 6109 South Don Carlos Dr. 4/15/2009 3440 S. 700 W. Date: Taylorsville, UT 84118 Samples Received: 4/15/09 9:00am **Turnaround Time:** 24 hours Phone # 801-403-8803 Purchase Order #: 801-967-5326 Fax# Non-asbestos fiber Non-fibrous type Asbestos type / Analysts Physical Description of Homo-Sample # Com Layer geneo calibrated visual type / percent / percent Subsample us estimate percent (Y/N)positive stop EI-9 gray insulation 54% qu,ca 46% Chrysotile gray layered insulation PI-10 PI-11 11-1 tan insulation wrap 11-2 gray layered insulation positive stop 12-1 tan insulation wrap PI-12 5 positive stop 12-2 gray layered insulation 100% qu,ma None Detected 13-1 black paneling TT-13 TDH 30-0235

Dallas NVLAP Lab Code 200349-0 TEM/PLM

EPA H20 TX 01402

AIHA PLM Accreditation 102929

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fg - fiberglass mw - mineral wool wo - wollastinite

ce - cellulose br - brucite ka - kaolin (clay)

or - organic ma - matrix

pe - perlite qu - quartz ta - talc sy - synthetic pa - palygorskite (clay)

Approved Signatories:

Christopher Williams Analyst

2-2-1-50

QAC Leslie Crisp, P.G.

Technical Manager Chad Lytle

Fire Damage significant fiber damage - reported percentages reflect unaltered fibers
 Fire Damage no significant fiber damages effecting fibrous percentages
 Actinolite in association with Vermiculite

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 Contamination suspected from other building materials
 Favorable scenario for water separation on vermiculite for possible analysis by another method

9. < 1% Result point counted positive
 10. TEM analysis suggested

Page 5 of 6

Customer Info:

Attn: Cameron Hernandez

Customer Project:

CA Labs Project #:

CAL09042401

A-1 Enviromental, Inc.

6109 South Don Carlos Dr.

Taylorsville, UT 84118

ASARCO Demo (south lab)

3440 S. 700 W. **Turnaround Time:**

24 hours

Date: Samples Received: 4/15/09 9:00am

4/15/2009

Phone # 801-403-8803

Fax# 801-967-5326

Asbestos type / HomoPurchase Order #: Non-asbestos fiber

Non-fibrous type

Sample # ment

Analysts Physical Description of Layer Subsample

calibrated visual geneo estimate percent us (Y/N)

type / percent / percent

OP-14

14-1 tan surfaced tan plaster

None Detected

100% bi,qu,ca

Dallas NVLAP Lab Code 200349-0 TEM/PLM

EPA H20 TX 01402

TDH 30-0235

AIHA PLM Accreditation 102929

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sy - synthetic qu - quartz

Approved Signatories:

Christopher Williams

Analyst

QAC Leslie Crisp, P.G. Technical Manager Chad Lytle

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5. Not enough sample to analyze

CRISP CRISP

PAGE 02/02

PAGE 89/11



Crisp Analytical Laboratories, LLC. Phone: 972-488-1414
ZUS1 Hutton Dr. Fax: 972-488-8006

Suite 301 Carrollton, TX 75006 After hours Mobile: 469-283-5282

	T.			ļ
Client Name: A-	(Environmental	CA Labs job # CAL	09042401]
	95. Dan Carlos Dr	Billing Address:		_
	ylorsville utah 84118	(if different)	AME	_
phone number:				
fax number:	1-967-5326	Project Name: ASAI	RCO Demo (sout	h Lab) 1 84114
Send Reports to:	meron Hermindez	Project Number: 3440	S. 700 W. Saitlak	ecity, utah oil
Sample Number:	Sample Location:	Sample Data/Time	Sample Volume (L)	Sample Doscription
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P-2	west Hall wall	4/14/09 11:07	7 Bulk	Plaster
CT-3	sast Hall Ceiling	14/19/09 11:10	BUK	Ceiling tile
CT-4	North Entrave office	Carlin 4/14/09 11:15	BUK	Ceilingfile.
CT-5	Room 14 Cilling	14/14/09 11:19	BUIK	Ceiling tile
CT-10	Room 19 Ceiling	4/14/09 11:25		Ceiling the
EI-77	Phone Room Eaun South Si	de 4/14/09 11:40	BUK	Elbow Insulation
EI-8 Stopon	Basement Sulh middle Ro	m 4/14/09 11:43		El bow Insulation
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PI -10)	Phone Foom Nown 5-1465	Je 4/14/09 11:55	The state of the s	Pire Insulation
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Materials Characterization - Bulk Asbestos Analysis

Laboratory Analysis Report - Polarized Light

A-1 Enviromental, Inc.

Attn: Cameron Hernandez

Customer Project: ASARCO Demo (North Lab) 3440 S. 700 W. 6109 South Don Carlos Dr.

4/15/2009 CAL09042402 Date Reference #: Taylorsville, UT 84118

Analysis and Method

Summary of polarizing light microscopy (PLM / Stereomicroscopy bulk asbestos analysis) using the methods described in 40CFR Part 763 Appendix E to Subpart E (Interim and EPA 600 / R-93 / 116 (Improved). The sample is first viewed with the aid of stereomicroscopy. Numerous liquid slide preparations are created for analysis under the polarized microscope where identifications and quantifications are preformed. Calibrated liquid refractive oils are used as liquid mouting medium. These oils are used for identification (dispersion staining). A calibrated visual estimation is reported, should any asbestiform mineral be present. Other techniques such as acid washing are used in conjugation with refractive oils for detection of smaller quantities of asbestos. All asbestos percentages are based on calibrated visual estimation traceable to NIST standards for regulated of asbestos. Traceability to measurement and calibration is achieved by using known amounts and types of asbestos from standards where analyst and laboratory accuracy are measured. As little as 0.001% asbestos can be detected in favorable samples, while detection in unfavorable samples may approach the detection limit of 0.50% (well above the laboratory definition of trace).

Discussion

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TDH 30-0235 Dallas NVLAP Lab Code 200349-0 TEM/PLM EPA H20 TX 01402 AIHA PLM Accreditation 102929

Overview of Project Sample Material Containing Asbestos

Customer Pro		ASARCO Demo (North Lab) 34	40 S. 700 W.	CA Labs Project #: CAL09042402	
Sample #	Layer #	Analysts Physical Description of Subsample	Asbestos type / calibrated visual estimate percent	List of Affected Building Material Types	
				white insulation	
EI-5	5-1	white insulation	12% Amosite		

Glossary of abbreviations (non-asbestos fibers and non-fibrous minerals):

ca - carbonate gypsum - gypsum bi - binder or - organic ma - matrix mi - mica ve - vermiculite ot - other pe - perlite qu - quartz fg - fiberglass mw - mineral wool wo - wollastinite ta - talc pa - palygorskite (clay)

wo - wollastinite
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sy - synthetic
ce - cellulose
br - brucite
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CA Labs Project #: **Customer Project:** Attn: Cameron Hernandez **Customer Info:** CAL09042402 A-1 Enviromental, Inc. ASARCO Demo (North Lab) 6109 South Don Carlos Dr. 4/15/2009 Date: Taylorsville, UT 84118 3440 S. 700 W. 4/15/09 9:00am **Turnaround Time:** Samples Received: 24 hours Phone # 801-403-8803 Purchase Order #: 801-967-5326 Fax# Non-fibrous type Homo-Asbestos type / Non-asbestos fiber Analysts Physical Description of Sample # Com Layer / percent type / percent geneo calibrated visual Subsample ment # estimate percent us (Y/N) 100% bi,qu,ca tan surfaced white plaster None Detected 100% qu,ca **None Detected** tan plaster 100% mi,ca None Detected white compound JC-2 90% qu,gy 10% ce None Detected white drywall with paper 100% ca,bi None Detected white surfacing CT-3 30% fg 70% ce **None Detected** tan ceiling tile 100% qu,bi None Detected white surfacing CT-4 Dallas NVLAP Lab Code 200349-0 TEM/PLM TDH 30-0235 AIHA PLM Accreditation 102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

Preparation Method: HCL acid washing for carbonate based samples, chemical reduction for organically bound components, oil immersion for

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ka - kaolin (clay) pa - palygorskite (clay)

Approved Signatories:

Christopher Williams Analyst

21-21-63

OAC Leslie Crisp, P.G. Technical Manager Chad Lytle

6. Anthophyllite in association with Fibrous Talc 1. Fire Damage significant fiber damage - reported percentages reflect unaltered fibers

7. Contamination suspected from other building materials 8. Favorable scenario for water separation on vermiculite for possible analysis by another method

9. < 1% Result point counted positive

2. Fire Damage no significant fiber damages effecting fibrous percentages
3. Actinolite in association with Vermiculite

Layer not analyzed - attached to previous positive layer and contamination is suspected
 Not enough sample to analyze

CA Labs Project #: **Customer Project: Customer Info:** Attn: Cameron Hernandez CAL09042402 A-1 Enviromental, Inc. 6109 South Don Carlos Dr. ASARCO Demo (North Lab) 4/15/2009 Taylorsville, UT 84118 3440 S. 700 W. Date: **Turnaround Time:** Samples Received: 4/15/09 9:00am 24 hours Phone # 801-403-8803 Purchase Order #: Fax# 801-967-5326 Analysts Physical Description of Non-fibrous type Homo-Asbestos type / Non-asbestos fiber Sample # Layer Com calibrated visual type / percent / percent Subsample geneo ment estimate percent us (Y/N) 100% ce None Detected tan ceiling tile 88% qu,ca 12% Amosite white insulation EI-5 positive stop EI-6 tan insulation positive stop EI-7 tan insulation None Detected 85% ce 15% qu,bi **DW-8** tan wrap None Detected 85% ce 15% qu,bi **DW-9** tan wrap 15% qu,bi None Detected 85% ce DW-10 EPA H20 TX 01402 TDH 30-0235 Dallas NVLAP Lab Code 200349-0 TEM/PLM

AIHA PLM Accreditation 102929

Analysis Method: Interim (40CFR Part 763 Appendix E to Subpart E) / Improved (EPA-600 / R-93/116)

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Approved Signatories:

Technical Manager

Chad Lytle

Christopher Williams

Analyst

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QAC

Leslie Crisp, P.G.

10. TEM analysis suggested



Crisp Analytical Laboratories, LLC. Phone: 972-488-1414
2031 Hutton Dr. Fax: 972-488-8006

Sudte 301

Carrollton, TX 75006

After hours Mobile: 469-283-5282

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fax number:		Project Name:	ASARC	O Demo. (Nort	Todab)
0	meron Hernandez	Project Number:	34405.	7000- Saltla	ce city utal 8411
Sample Number:	Sample Location:	Sample Da	ta/Time:	Sample Volume (1	Sample Descript
P-1	Hall Wall	4/14/09	12:40	Bulk	Plaster
	Pirest room Wall	4/14/04	12:45	BUK	Sixt Corporal Scheeters Ceiling tile Ceiling tile
	- 11	4/14/09	12:52	BULK	Ceiling tile
CT-3	South East From Ceiline		12:55	BULK	Ceiling tile
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FI-10 SSM IN		4/14/09	1:10	Bolk	le how to-cular
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DIXON INFORMATION INC.-

MICROSCOPY, ASBESTOS ANALYSIS & CONSULTING — A.I.H.A. ACCREDITED LABORATORY # 101579 NVLAD LAB CODE 101012-0

April 15, 2009

Mr. Cameron Hernandez A-1 Environmental, Inc. 6109 Don Carlos Drive Taylorsville, UT 84118

Ref: Batch # 84005, Lab # A-1 820
Received April 15, 2009
Test report
ASARCO Labs
3440 S. 700 W. Salt Lake City, Utah 84119
Sampled by Cameron Hernandez, 4/15/09, 1145

Dear Mr. Hernandez:

Sample A-1 820 has been analyzed by visual estimation based on EPA-600/M4-82-020 December 1982, and EPA/600/R-93/116 July 1993 optical microscopy test methods. Appendix "A" contains statements which an accredited laboratory must make to meet the requirements of accrediting agencies. It also contains additional information about the method of analysis. This analysis is accredited by NVLAP. Appendix "A" must be included as an essential part of this test report. The data for this report is accredited by NVLAP for laboratory number 101012-0. It does not contain data or calibrations for tests performed under the AIHA program under lab code 101579.

This report may be reproduced but all reproduction must be in full unless written approval is received from the laboratory for partial reproduction. The results of analysis are as follows:

Lab A-1 820, Field AI-30 Attic Insulation

This is gray mineral wool with a trace of white plaster. Asbestos is none detected.

In order to be sure reagents and tools used for analysis are not contaminated with asbestos, blanks are tested. Asbestos was none detected in the blanks tested with this bulk sample set.

Very truly yours,

Steve H. Dixon, President

Analyst: Steve H. Dixon

__ Date Analyzed: 4/15/09

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BULK ANALYTICAL REQUEST FORM

BULK ANALYTICAL REQUEST	LOWIN	
Turnaround Time - Circle One	Batch Number	9400S
Rush (24 hours \$25.00 per sample)		
Non-rush (5 Working days \$17.00 per sample)		
Name of location sample was taken at ASARCO Labs Street address sample was taken at 3440 S. 700 W. Salt Sampled by ameron Hernandes	Take City, ul	8-1119
Report to be sent to Company: A Environmental Tree Company:	GAME	
Address: 6/095. Dan Carlos Dr. Address:	State:	
City: Lawlocs Villo State: 11 fach City:	State:	
Zip Code: 94118 Zip Code:		
	, .	
E-mail: alenvironmental Comeron & yahoo. Com PO#:	amples Collected	
Field # Description of Sample	Date Time	Lab#
AI-30 Affic Insulation	1/15/09 11:45	520
	-	
Chain of Custody		
Submission of asbestos samples for analysis and/or	signing a chain o	f custody is the
and constitute	s an agreement to	pay 101 301 11002
provided at Dixon Information Incorporated standard schedule	of fees for services.	
	1 /	1
Summer of the second se	-	ime: 12:15
Received by Table Committee Committe	-	ime: 1212 ime: 1615
Bassived by Analyst	alo.	
Returned by Lab:	Date:T	ime:

8014860849

Appendix "A"

"This report relates only to the items tested. This report must not be used to claim product endorsement by NVLAP or AIHA."

NVLAP and AIHA requires laboratories to state the condition of samples received for testing. These samples are in acceptable condition for analysis unless there is a statement in the report of analysis that a test item has some characteristics or condition that precludes analysis or requires a modification of standard analytical methodology. If a test item is not acceptable, the reasons for non-acceptability will be given under the laboratory number for that particular test item.

Methods of Analysis and Limit of Detection

In air count analysis, the result may be biased when interferences are noted.

The accuracy of asbestos analysis in bulk samples increases with increasing concentration of asbestos. Pigments, binders, small sample size, and multiple layers may affect the analysis sensitivity.

There are two methods for analysis of asbestos in a bulk test sample. Visual estimation is the most sensitive method. If an analyst makes a patient search, 0.1% or less asbestos can be detected in a bulk sample.

The second method of analysis is a statistical approach called point counting. EPA will not accept visual estimations if a laboratory detects a trace of asbestos in a sample i.e. anything less than 1% asbestos. Government agencies regulate asbestos containing materials (ACM) whenever the ACM is more than 1%. OSHA requirements apply on samples containing any amount of asbestos.

Due to the higher charge for a point count analysis, Dixon Information Inc. does not perform a point count unless authorized to do so by the client. If a sample is point counted, chemical treatments will also be used to concentrate the asbestos in the sample. This is permitted by the EPA method and it increases the accuracy of the analysis.